

Is There a Relationship Between Epistaxis and Anatomical Variations?

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ABSTRACT

Objective: The aim of our study is to introduce the relationship between epistaxis and anatomical variations and present the current treatment approach.

Materials and Methods: Forty-five patients (28 males and 17 females) that presented to otorhinolaryngology clinics at Mengucek Gazi Training and Research Hospital with pre-diagnosed epistaxis between October 2018 and April 2019 were included in the study. Age, sex and structural causes and anatomical localization of epistaxis in patients were analysed.

Results: The median age of the patients was 42, ranging from 20 to 60 years. Focus of bleeding was observed on the right in 16 cases (35.5%), left in 14 cases (31.1%) and bilateral in nasal cavity in 15 cases (33.3%). Bleeding was from the anterior septum in front of the maxillary ostium line. Anatomical variations were seen in 31 patients (68.8%) (septal deviation in 12, septal perforation in two, and concha hypertrophy in 17).

Conclusion: Epistaxis is one of the most common ear, nose, and throat emergencies. Etiological reasons must be analysed for the treatment to be effective.

Keywords: Anatomy, general ENT, Otolaryngology-ENT, Rhinology

Introduction

Epistaxis, one of the most common ear, nose, and throat (ENT) emergencies, refers to nosebleeds caused by vascular pathology and clotting disorders due to nasal mucosa damage [1].

Epistaxis is observed in about 60% of the population, more commonly in individuals aged under 10 and above 50 [2]. When epistaxis is evaluated according to the sex, there are studies reporting that it is more common in men [3]. The frequency of epistaxis increases in spring and winter due to the increase in the rate of upper respiratory tract infections, heated and dry indoor air, and less humidity [4]. Bleeding is mild and tends to stop spontaneously in most of the patients.

The nasal blood supply comes from both internal and external carotid arteries [5]. About 90-95% of nosebleeds occur in the anterior part of the nose, most of them in Little's area (Kiesselbach's plexus) [6]. The maxillary ostium line separates the anterior and posterior bleeding points [7]. Posterior epistaxis is generally caused by the sphenopalatine artery and may cause severe bleeding [8]. While anterior epistaxis is more commonly seen in children and adults, posterior epistaxis is more frequent among elderly people with a systemic disease such as hypertension [1].

It is generally difficult to determine the causes of epistaxis, which is generally accurately diagnosed in one-fifth of the patients [9]. Unknown causes are classified as idiopathic. Etiological causes are generally classified into two groups: local and systemic [9]. Although local causes consist of bleedings occurring due to conditions inside or outside the nasal cavity, systemic causes refer to those due to systemic diseases or medication use.

The nose is the primary organ of the respiratory system and has a mucosal surface. It also contains a rich submucosal vascular plexus and a large number of glands [10]. The interior of the

nose has air-filled cavities whose size and shape vary from person to person. The anatomy of here is very complicated, and there may be large differences among individuals. Since there are structural variations in the nose, vascular structures beneath the mucosa, and vasoerectile structures in the inferior turbinate, bleeding can easily occur due to the differences in temperature, humidity, and pressure [7].

Materials and Methods

This study involves the analysis of 45 adult patients presented to the ENT outpatient clinic with pre-diagnosed epistaxis over a 7-month period from October 1, 2018 to April 1, 2019. Complete blood count, bleeding time, clotting time, and coagulation tests were performed for the patients with risk of bleeding diathesis, and their prothrombin time, partial thromboplastin time, activated partial thromboplastin time, and international normalized ratio test results were checked. The patients' blood pressure was also recorded to identify cases with high blood pressure. Furthermore, the history of anticoagulant drug use, such as acetylsalicylic acid, nonsteroidal anti-inflammatory, heparin, or coumarin-type drugs, that may cause a bleeding tendency was obtained. The patients with high blood pressure and those with a history of using the above-mentioned drugs, trauma, nasal surgery, or bleeding diathesis were not included in the study.

In order to reveal the focus of bleeding and anatomical variations, if any, in the nasal cavity, nasal saline irrigation was performed for patients as needed, and the blood clots in the nasal cavity were aspirated. For the patients who were not cooperative during clinical examination, topical anesthesia was administered to both nasal cavities through 1-2 lidocaine HCL sprays (Xylocaine® pump 100 mg 50 mL; AstraZeneca). After these procedures and clinical examination, all the patients underwent an anterior rhinoscopic examination with a forehead mirror and a 0° rigid nasal telescope, and flexible fiberoptic nasal endoscopy was performed as needed. The treatment options of cautery, packing, and antibiotherapy were offered to the patients considering the age, sex, side of bleeding, site of bleeding, and the presence of anatomical variations.

The present study was approved by the clinical ethics committee of Erzincan Binali Yıldırım University (accession number: 604.01.02-E.18707). All the participants provided signed informed consent before they were subjected to the research procedures.

Statistical Analysis

Statistical analysis was performed using the Statistical Package for Social Sciences software package version 20.0 (IBM SPSS Corp., Armonk, NY, USA). Descriptive statistical parameters were calculated. Descriptive statistics as number, percentage, mean, and standard deviation were used for data analysis. A $p < 0.05$ was defined as statistically significant.

Results

Focus of bleeding and structural anomalies in the patients were detected using an anterior rhinoscope and nasal endoscope where necessary. The mean age of the 45 patients was 42 ± 12.1 years, ranging from 20 years to 60 years. Twenty-eight patients (62.2%) were men and 17 (37.7%) were women. In all patients, bleeding was detected in the anterior segment of the nasal cavity. Focus of bleeding was on the right in 16 cases (35.5%), left in 14 cases (31.1%), and bilateral in 15 (33%) cases. None of the patients had a focus of bleeding in the lateral wall of nasal cavity. The site of bleeding was the anterior septum in front of the maxillary ostium line. The following anatomical variations were observed in a total of 31 cases (68.8%): septal deviation in 12 patients (38.7%) (accompanied by turbinate hypertrophy in 7 patients), septal perforation in 2 (6.4%), and concha hypertrophy in 17 (54.8%) patients (accompanied by septal deviation in 12 patients) (Table 1).

In the treatment process, anterior nasal packing and antibiotherapy were applied to eight patients (17.7%) and septoplasty was recommended for one patient (2.2%). In this patient, since the mucosa structure covering the septum was very thin on the deviated side and there was a high degree of septal deviation, his vascular structure was fragile. Cauterization was undertaken in three patients (6.6%). Local treatment was initiated for the remaining 33 patients (73.3%) in the outpatient clinics after performing necessary interventions.

Discussion

Epistaxis is one of the most common symptoms in daily practice of ENT emergencies. Active nasal bleeding is seen in approximately 5-10% of the population and occurs in all age groups, but in most cases, it stops spontaneously [4]. Nosebleeds are categorized as anterior and posterior depending on the focus of bleeding. Anterior epistaxis occurs more commonly in children and young adults, rarely causing severe bleeding. Posterior epistaxis is mainly seen in elderly people, and in these cases, it is hard stop bleeding due to difficulty in accessing the bleeding site since the starting point is located more posteriorly [11].

Table 1. Frequency and percentage of the anatomical variations

Anatomical variations	N	(%)
Nasal septal deviation	12	38.7
Nasal septal perforation	2	6.5
Concha hypertrophy	17	54.8
Total	31	100

In his clinical study of 1.724 patients, Juselius reported that epistaxis was more commonly seen in men (58%) than in women (42%) [12]. Similarly, Parajuli reported that 61% of the patients with epistaxis were men. Huang et al. [13] reported a 3:1 men/women ratio in patients with epistaxis. In a study by Kaygusuz et al. [14] conducted in Turkey, it was reported that the rate of epistaxis in men was approximately two times higher compared to women. Our findings are consistent with the literature with 28 of our patients being men and 17 being women.

In the current study, the focus of bleeding was anterior in all patients. The bleeding site was Little's area, consistent with a retrospective study conducted by Varshney et al. [15] in a period of 2.5 years and another by Pollice et al. [16] who investigated 88 patients.

The etiology of epistaxis can be divided into two groups as local and systemic causes [16]. Determination of etiological factors has a guiding role in determining both the location of bleeding and treatment. Some local factors, such as trauma, foreign bodies, and allergic rhinitis, are among the leading causes of anterior nosebleeds. Local causes may also include structural causes, including chronic irritation, septal deviation, septal perforation, concha hypertrophy, as well as nasal polyps, nasal cavity tumors, and vascular malformations. In case of nosebleeds that occur due to existing diseases or after drug use, systemic causes; for example, hypertension, platelet function disorders, hemophilia, leukemia, thrombocytopenia, liver diseases, and systemic drug use should also be investigated. The most common systemic cause is hypertension [14].

In this study, anatomical variations were detected in 31 (68.8%) of 45 patients. A septal deviation was present in 12 patients (38.7%), septal perforation in 2 (6.4%), and concha hypertrophy in 17 (54.8%) patients. In a study of 299 patients, Ando et al. found septal deviation in 49.8% of the patients [17]. In another study, Côrteve et al. [18] reported that the patients with epistaxis had a higher incidence of

septal deviation compared to the control group. Recurrent bleeding in nasal septum deviations is considered to develop as a result of mucosal dryness and cracks due to mucosal tension or turbulent flow in the deviated part [19].

In a study by İla et al. [20] it was reported that 5.2% of 76 patients with choanal polyps presented with epistaxis. Evaluating nine patients with septum and/or concha diseases, Özel et al. [21] reported that 33.3% had complaints of epistaxis and there was 11.2% regression after surgery. In their case study Toplu et al. [22] found that one patient with concha hypertrophy also presented with the complaint of epistaxis. Kaygusuz et al. [14] found that 20% of the patients with the complaint of epistaxis had septal perforation in etiology. In their case report, Ceylan et al. [23] stated that septal perforation was present in the examination of one patient who had recurrent epistaxis.

Our study has several limitations. First, the number of patients was low. In our study, the patients with high blood pressure and those with a history of using the above-mentioned drugs, trauma, nasal surgery, or bleeding diathesis were not included. The anatomic variations could not be investigated in these patients.

In conclusion, in order to control epistaxis, various medical or surgical treatments are performed depending on the site, severity, and cause of epistaxis. In the treatment of epistaxis, anatomical variations in the nose should be considered and complications during the treatment should be prevented.

Ethics Committee Approval: Ethics committee approval was received for this study from Erzincan Binali Yıldırım University (604.01.02-E.18707).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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